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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/593,219	06/15/2007	Andrew Mark Shaw	MC1-8346	7038

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EXAMINER	
LEPISTO, RYAN A	

ART UNIT	PAPER NUMBER
2883	

MAIL DATE	DELIVERY MODE
09/09/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/593,219	SHAW, ANDREW MARK	
	Examiner	Art Unit	
	RYAN LEPISTO	2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 August 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *59-117* is/are pending in the application.

4a) Of the above claim(s) *65-67 and 75-117* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *59-64 and 68-74* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 September 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *9/15/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of group I in the reply filed on 8/20/08 is acknowledged.

Priority

If applicant desires to claim the benefit of a prior-filed application under 35 U.S.C. 371, a specific reference to the prior-filed application in compliance with 37 CFR 1.78(a) must be included in the first sentence(s) of the specification following the title or in an application data sheet. For benefit claims under 35 U.S.C. 120, 121 or 365(c), the reference must include the relationship (i.e., continuation, divisional, or continuation-in-part) of the applications.

If the instant application is a utility or plant application filed under 35 U.S.C. 111(a) on or after November 29, 2000, the specific reference must be submitted during the pendency of the application and within the later of four months from the actual filing date of the application or sixteen months from the filing date of the prior application. If the application is a utility or plant application which entered the national stage from an international application filed on or after November 29, 2000, after compliance with 35 U.S.C. 371, the specific reference must be submitted during the pendency of the application and within the later of four months from the date on which the national stage commenced under 35 U.S.C. 371(b) or (f) or sixteen months from the filing date of the prior application. See 37 CFR 1.78(a)(2)(ii) and (a)(5)(ii). This time period is not

extendable and a failure to submit the reference required by 35 U.S.C. 119(e) and/or 120, where applicable, within this time period is considered a waiver of any benefit of such prior application(s) under 35 U.S.C. 119(e), 120, 121 and 365(c). A benefit claim filed after the required time period may be accepted if it is accompanied by a grantable petition to accept an unintentionally delayed benefit claim under 35 U.S.C. 119(e), 120, 121 and 365(c). The petition must be accompanied by (1) the reference required by 35 U.S.C. 120 or 119(e) and 37 CFR 1.78(a)(2) or (a)(5) to the prior application (unless previously submitted), (2) a surcharge under 37 CFR 1.17(t), and (3) a statement that the entire delay between the date the claim was due under 37 CFR 1.78(a)(2) or (a)(5) and the date the claim was filed was unintentional. The Director may require additional information where there is a question whether the delay was unintentional. The petition should be addressed to: Mail Stop Petition, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

If the reference to the prior application was previously submitted within the time period set forth in 37 CFR 1.78(a), but not in the first sentence(s) of the specification or an application data sheet (ADS) as required by 37 CFR 1.78(a) (e.g., if the reference was submitted in an oath or declaration or the application transmittal letter), and the information concerning the benefit claim was recognized by the Office as shown by its inclusion on the first filing receipt, the petition under 37 CFR 1.78(a) and the surcharge under 37 CFR 1.17(t) are not required. Applicant is still required to submit the reference in compliance with 37 CFR 1.78(a) by filing an amendment to the first sentence(s) of the specification or an ADS. See MPEP § 201.11.

Specification

The disclosure is objected to because of the following informalities:

Please enter the co-pending PCT application number on the last line of page 7 of the specification.

Also, claims should not be included in the specification. Please remove the "Further aspects of the invention are defined in the following clauses:". These claims don't even match the pending claims and the claims are written in improper multiple dependent form.

Appropriate correction is required.

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "406" has been used to designate both collimating optics and core and character "414" has been used to designate both detector and normal surface (page 17).

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of

any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 59-61, 63, 64 and 68-73 are rejected under 35 U.S.C. 102(b) as being anticipated by **Lerber et al (US 2002/0092977 A1)** (Lerber). Lerber teaches an evanescent wave cavity-based optical sensor (Figs. 1-10) comprising an optical cavity (3 with 4 and 5) formed by a pair of highly reflective surface (4, 5) (paragraph 0023) such that light within the cavity makes a plurality of passes between the surfaces (4, 5) (paragraph 0025), an optical fiber sensor path (3) (in any of Figs. 3-5, 7, 10) between the surfaces (4, 5) including a reflection from a totally internally reflecting (TIR) surface (the core (10)/clad (11) boundary of fiber (3) in Fig. 3 for example) that generate an evanescent wave to provide an attenuated sensing function (paragraphs 0039-0040), a light source (1) to optically excite and inject a single pulse (Fig. 2a) of light into the cavity (3 with 4 and 5) at two different wavelengths (paragraph 0063), a detector (7) to detect ring-down decaying oscillations (Fig. 2b) of the light pulse (Fig. 2a) within the cavity (3 with 4 and 5) (paragraph 0025) at the different wavelengths (paragraph 0064), a signal processor (9) coupled to the detector (7) and configured to provide a time-

resolved output (gamma) dependent on the cavity length (L) (paragraphs 0031-0032) responsive to a light level within the cavity and having a time-resolution corresponding to a set of the pulse oscillations for sensing operating at gamma (paragraphs 0028-0031), the TIR surface is provided with a functionalizing material (paragraph 0043) over the length of the TIR surface (12 for example) such that evanescent wave interacts with the material and a target (the substance of paragraph 0043) to be sense is detectable as a change in absorption of the evanescent wave (paragraphs 0043-0046) or using two different grating materials responsive to different wavelengths to sense a target as a change of the absorption of the wave at the particular wavelength (paragraph 0065).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 62 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lerber as applied to claims 59-61, 63, 64 and 68-73 above, and further in view of **DePue et al (US 2005/0094150 A1)** (DePue).

Lerber teaches the evanescent wave cavity-based optical sensor previously discussed.

Lerber does not teach expressly the TIR surface provided with an electrically conducting material such that the evanescent wave excites a surface plasmon whereby

a change in absorption of the wave due to the change in the surface plasmon excitation is detectable using the detector to provide the sensing function.

DePue teaches a evanescent wave cavity-based ring-down optical sensor (Figs. 1a, 2b) using metal conductive TIR surface (167, 177) so the evanescent wave excites a surface plasmon (paragraph 0023) whereby a change in absorption of the wave due to the change in the surface plasmon excitation is detectable using the detector to provide the sensing function (paragraph 0028-0029).

Lerber and DePue are analogous art because they are from the same field of endeavor, evanescent wave cavity-based optical sensors.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to replace the cavity taught by Lerber with the cavity using plasmon resonance taught by DuPue into the sensor system taught by DuPue since both Lerber and DuPue use resonant cavities, source and detector to measure a characteristic of a target.

The motivation for doing so would have been to improve the sensing sensitivities to allow the use of smaller sample sixes and to have the ability to detect smaller concentrations (DePue, paragraph 0003).

Claim 74 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lerber as applied to claims 59-61, 63, 64 and 68-73 above, and further in view of what would have been obvious to one of ordinary skilled in the art at the time of applicant's invention.

Lerber teaches the evanescent wave cavity-based optical sensor previously discussed.

Lerber does not teach expressly the cavity having a length of at least 5 meters.

Lerber teaches that the sensing is based on a relationship between the time constant, cavity length, refractive index of the fiber, the loss factor and reflectivities of the couplers (paragraph 0028-0029) with an example of the length being L = 2 cm or 2m (paragraph 0034).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary the variables of the given relationship including the cavity length to be 5 meters or more, since it has been held that "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). "The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages."); In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969). For more recent cases applying this principle, see Merck & Co. Inc. v. Biocraft Laboratories Inc., 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989); In re Kulling, 897 F.2d 1147, 14 USPQ2d 1056 (Fed. Cir. 1990); and In re Geisler, 116 F.3d 1465, 43 USPQ2d 1362 (Fed. Cir. 1997).

The motivation for doing so would have been adjust the ring-up and ring-down times of the sensor to meet the users parameters (paragraph 0028).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. All of the following references teach evanescent wave cavity-based optical sensors similar to applicant's:

US 5,821,410 US 5,986,768 US 2002/0018504 A1

US 6,490,039 B2 US 6,515,749 B2 US 2003/0109055 A1

US 6,768,548 B2 US 6,833,920 B2 US 6,842,548 B2

US 2005/0117157 A1 US 7,012,696 B2 US 2006/0177939 A1

US 2006/0183241 A1 US 7,323,677 B1 US 7,352,468 B2

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan Lepisto whose telephone number is (571) 272-1946. The examiner can normally be reached on M-Th 7:30 AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ryan Lepisto/
Examiner, Art Unit 2883